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TAGS: [KNNP](#) [MNUC](#) [ASEC](#) [KCRM](#) [PARM](#) [PINR](#) [PREL](#) [CA](#) [XS](#)
SUBJECT: TECHNICAL DISCUSSIONS REGARDING THE REMOVAL OF
HELIUM-3 STORED AT ONTARIO POWER GENERATION

REF: A. A. TORONTO 000186
[1](#)B. B. STATE 082558
[1](#)C. C. TORONTO 000173
[1](#)D. D. STATE 078415
[1](#)E. E. TORONTO 000163 AND REFERENCES THEREIN

[1](#)1. (U) This is an action request for Embassy Ottawa. Please see paragraph 3.

[1](#)2. (SBU) SUMMARY: Ontario Power Generation (OPG) has expressed interest in working with DOE on helium-3 (He-3) supply, stipulating that the United States would remove and retain ownership of all residual tritium containers stored at OPG. Technical discussions held in Toronto on 19 October 2009 between a U.S. team and OPG representatives provided each side with the information necessary to understand the effort required to remove the residual tritium storage units from the OPG facility in Darlington, Ontario, Canada, to the DOE Savannah River Site. Major issues uncovered include: (1) lack of certified overpacks for shipment; (2) cross border transport; (3) need for the Canadian team to develop clear guidance on tritium monitoring requirements and (4) possible compensation for residual tritium. With this information, both sides will be better able to develop a workplan and associated costs designed to determine the feasibility of this effort. The team also toured the Darlington Tritium Recovery Facility. A separate detailed technical report is being drafted by the Savannah River team. End Summary.

[1](#)3. (SBU) ACTION REQUEST: Post is requested to monitor OPG's interaction with the GOC on tritium exporting requirements as referenced in paragraph 11.

[1](#)4. (SBU) BACKGROUND: Helium-3 (He-3) is a tritium decay product used for neutron detection, cryogenics, medical, oil and gas exploration, and other applications. After the terrorist attacks of September 11, the U.S. government began to significantly increase its nuclear detection capabilities both at home and around the world. This resulted in a corresponding increase in demand for He-3 that far exceeds available U.S. supply. As a result, the USG has embarked on a three-pronged approach to address the issue: (1) reduce demand through reprioritizing programmatic requirements, (2) foster the introduction of alternative technologies not dependent upon He-3, and (3) increase available supply. This third area includes discussions with entities that have available supplies of He-3, such as countries that use heavy water reactors that produce tritium. Ontario Power Generation (OPG) maintains the largest fleet of such reactors in the world and has been storing tritium since the late 1980's. It is anticipated that they may have as much as 60,000 liters of He-3 that could be readily harvested.

[1](#)5. (SBU) DARLINGTON TRITIUM REMOVAL FACILITY: On October 19,

2009, representatives from DOE/NNSA, DHS, and ConGen Toronto met with OPG at the OPG Darlington, Ontario, Canada, reactor and tritium separation and storage facility. Darlington is the location of the Darlington Tritium Removal Facility (DTRF), where all OPG heavy water plants send their heavy water for detritiation. DTRF is the largest civilian tritium removal facility in the world, capable of processing 10 million grams of heavy water per day. The storage facility for the separated tritium is also located on the Darlington plant site. Separation of tritium at DTRF has been on-going since late 1989. U.S. representatives included: Joe Glaser, NA-4; Nanette Founds, NA-122.3; Orvis Taylor, NA-261; Greg Slovik, DHS/DNDO; Paul Cloessner and Jim Klein, Savannah River Site, and Lee MacTaggart, ConGen Toronto. OPG representatives included: Mario Cornacchia, Director, Commercial Services; Lloyd Mathias, Product Manager, Isotope Sales; Alfred Mo, Product Manager, Isotope Sales; Bob Rankin, Manager DTRF; and Pauline Witke, Manager, Radioactive Material Transport.

¶16. (SBU) OPG PERSPECTIVE: From the outset of the meeting, Mr. Cornacchia stated that OPG has been contacted by "over a dozen parties worldwide" interested in purchasing OPG's He-3. We understand that these Parties propose to harvest the He-3 in-situ, i.e., at the OPG storage facility located in the Darlington plant site, thus leaving OPG to continue storing the residual tritium, and requiring OPG to eventually address disposition of the containers. Mr. Rankin also confided that he has proposed to his management that He-3 be harvested by his staff in the DTRF facility. To date, OPG management has been cool to this idea.

¶17. (SBU) OPG PERSPECTIVE CONT'D: In REF E, OPG expressed interest in working with DOE on He-3 supply, stipulating that the U.S. would remove and retain ownership of all He-3 containers stored at OPG. Since He-3 supply is not a core OPG business function, OPG views their role as supportive, with DOE leading the effort and requesting actions from OPG.

¶18. (SBU) ISSUES DISCUSSED: This technical discussion provided each side with the information necessary to understand the effort required to remove the residual tritium storage units from the OPG facility in Darlington, Ontario, Canada, to the DOE Savannah River Site. Major issues covered include: (1) lack of certified overpacks for shipment; (2) currently available overpacks can only hold one storage unit, (3) cross border transport; (4) need to develop a clear path forward on tritium accountability requirements; and (5) possible compensation for residual tritium.

¶19. (SBU) OVERPACKS: There are very few certified overpacks available for transporting the storage units from OPG to the Savannah River Site. US certified containers can only store one storage unit. The Canadian unit (of which there is at most one available) can store up to six, but is currently only approved to carry one. Fabrication time is estimated to be 18-24 months.

¶110. (SBU) TRANSPORT: There are no escort requirements for transporting the storage containers through Canada. The U.S. team needs to confirm escort requirements within the US and trans-border handoff.

¶111. (SBU) MONITORING: OPG was not certain about monitoring requirements that Canada might impose on the residual tritium embedded in the storage containers. OPG stated they need guidance from the Canadian Government, since the answer to the issue concerns GOC Policy.

¶112. (SBU) RESIDUAL TRITIUM COMPENSATION: Mr. Cornacchia also made the point that sale of tritium is part of OPG business. He stated his preference that, should there become a larger market for residual tritium, some arrangement be made for cost-sharing sales of the residual tritium stored in the

storage units. While not a near term issue, the USG needs to be aware of that possibility.

¶13. (SBU) NEXT STEPS AND U.S. ACTION ITEMS:

- Draft a technical report of the meeting and tour of DTRF
- The US team needs to confirm escort requirements within the US and trans-border handoff.
- Complete the Statement of Work and formal Request for Proposal
- As part of the negotiations, OPG will need us to sign a non-disclosure agreement

¶14. (SBU) The Department thanks Post for their assistance. For further information, please contact Joseph Glaser, DOE/NNSA, Office for Counterterrorism, 202-586-2648, joseph.glaser@nnsa.doe.gov.
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